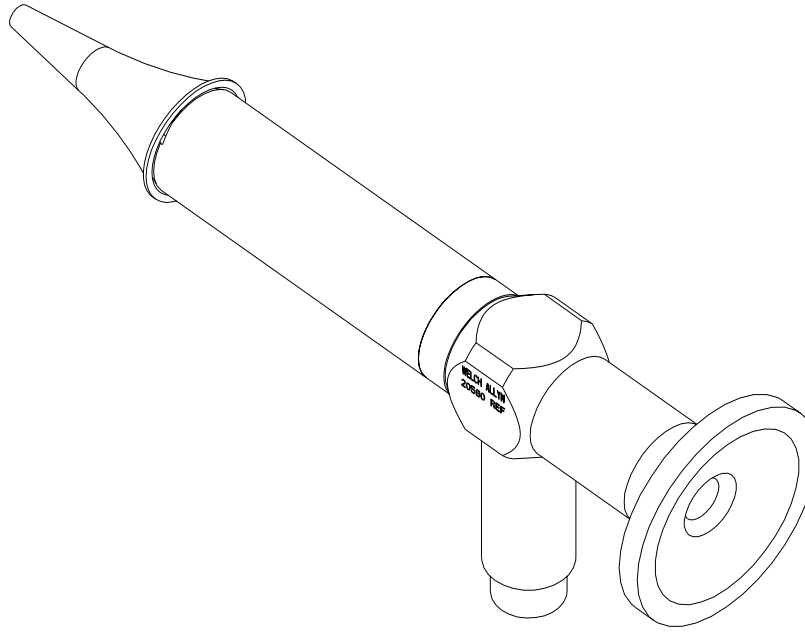
Manuals

Operation Manual

Video Otoscope 2

Service Document



Welch Allyn Inc.
Medical Products
4341 State Street Road
Skaneateles Falls, New York 13153-0220
USA
1 800 669-9771
(315) 685-4445

Copyright 1997

Part No. 205807 Rev A

Revision Page

Rev	Change Description	ECN#	Date	Initiator
A	New Release (Copyright)	5-34600	2/20/97	M Dahlin

Table of Contents

Section 1: General Information

Product Description . . . . . Page 3
Cleaning/Sterilization . . . . . Page 4
Specifications . . . . . Page 4
System leakage Current . . . . . Page 5
Tools and Equipment . . . . . Page 4
Recommended Inventory . . . . . Page 3

Section 2: Problem Solving

Troubleshooting . . . . . Page 6
Disassembly . . . . . Page 7

Illustrations

Figure 1 Component Description . . . . . Page 3
Figure 2 Leakage Current Test Setup . . . . . Page 5

Drawings

Video Otoscope Assembly Drawing #205800
Ear Endoscope Drawing #205803

Note that drawings are for reference only. Consult factory for current drawing and/or revision levels.

For system setup information, refer to LCI-100/200 Service Manual #VA316

Section 1

General Information

Description

Otoscope's are optical instruments used to explore the ear canal. This device is basically a 0° straight view length of tube containing a series of lenses. At the distal end, an objective lens captures the image of the object. A series of lenses then focus that image along the length of the tube to the proximal end of the scope. At the proximal end, the image is focused into a separate proximal coupling lens that transfers the image onto a CCD (Charged Couple Device). That image is then processed through video equipment for viewing, storing or printing. Illumination is obtained from the video device through the use of a fiber optics bundle to a fiber optic light post.

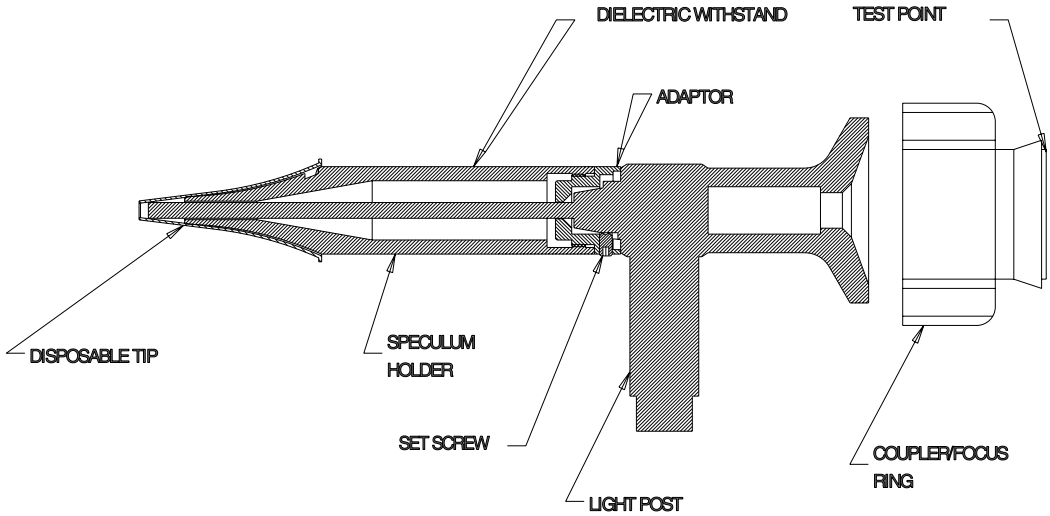


Figure 1

Recommended Inventory

Spec Holder Adaptor Assembly	205804
Set Screw	106113-21
Loctite-222	M30375
4mm Disposable tip	235037

Cleaning/Sterilization

The otoscope has three optical surfaces that must be checked routinely to ensure optimal illumination and imaging. These are the distal working tip, the rear view eye piece, and the fiber optic light post. These should be cleaned with warm water and a mild soap. A mixture of alcohol and acetone may be used for heavy or persistent staining. Optical lens paper should be used to avoid marring the optical surface.

Note: To avoid fogging, the rear portion of the scope should be entirely free of moisture before attaching to the coupler and/or camera.

Disinfect the scope per users manual. Avoid subjecting the scope to extreme temperature changes.

Specifications

Part Number (Assembly) 20580
Dimensions: . . . . . 2.7mm diameter
Resolution on 16mm object distance (Focal Point) . . . . . 10 line pairs per mm @ center
. . . . . 7 line pairs per field at -0.7 R
. . . . . 7 line pairs per field at +0.7 R
Locking Device . . . . . Storz type
Field of View: . . . . . Wide angle 80°
Apparent Field of View . . . . . 6°
Exit Pupil 1.8mm
Light Guide Connector . . . . . Circon ACMI

Tools and Equipment

Associated Research 411A1 AC Hipot JR or equivalent
45mm Optics Adaptor
0.035 Allen Wrench

System Leakage Current

When a camera system is used in conjunction with other video accessories, it may be necessary to measure the leakage current level of the entire set-up. A typical system setup is shown below using a standard leakage tester, this set-up will allow the overall system leakage current to be measured. If this value exceeds 100 microamps for the system, or 10 microamps at the otoscope patient contact point (or whatever the maximum requirements are for a particular region), an isolation transformer should be used.

Typical Current Leakage Test Set-Up

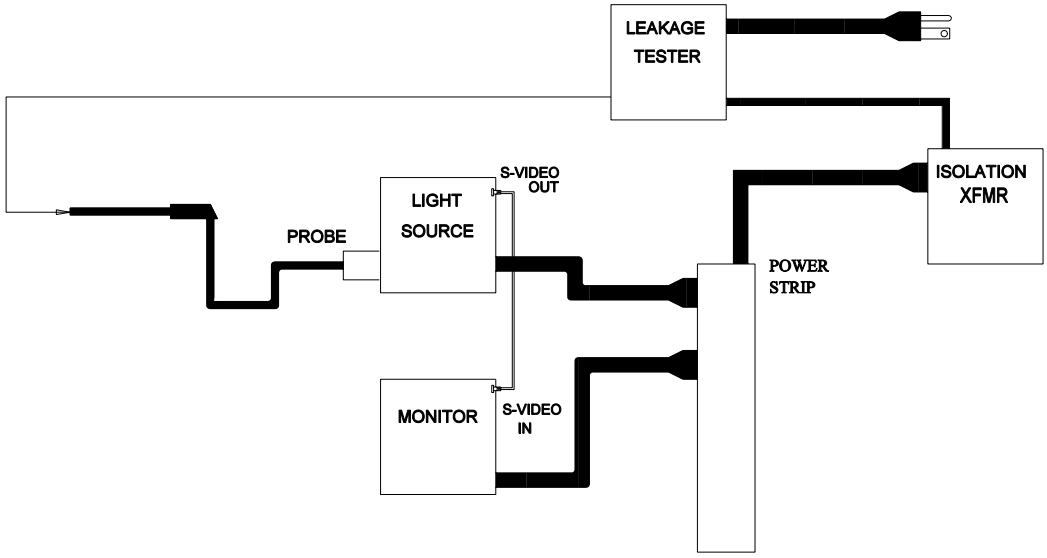


Figure 2

Section 2

Problem Solving

Symptom	Possible Cause	Solution
Otoscope view not clear or dark	Exposed optical surfaces dirty. Otoscope or coupler not focused. Otoscope damaged internally.	Clean with swab & Alcohol. Turn coupler/focus ring until image becomes clear. Return to scope manufacturer for service.
Light guide does not attach to otoscope.	Wrong or missing instrument adaptor. Adaptor or end tip damaged.	Install correct adaptor Return for service.
Video image dark or no image.	Broken fibers in light guide. Broken fibers in Otoscope. Defective video setup.	Replace light guide. Return for service. Correct setup problem (refer to video components operators or service manual).
Cloudy or foggy image.	Moisture between Coupler and Otoscope. Deposits on the Otoscope's optics. Probe temperature is less than optimal. Moisture has penetrated the Otoscope.	Detach and wipe dry. Inspect (Use magnifying glass) and clean as necessary. **Note that the distal tip is recessed and may trap materials that will affect the image. Clean the distal tip thoroughly.** Warm probe between your hands or use an anti-fog solution. Return for service.
Speculum Holder does not fit on Otoscope.	Damaged or bent Otoscope. Damaged Speculum Holder or Adaptor.	Return for service. Replace Speculum Holder and adaptor. **Note that the SpeculumHolder and Adaptor are a matched set and must be replaced as such.**
Speculum Holder art work (WA logo) does not line up properly with Otoscope.	Incorrect Speculum Holder matched to Otoscope.	Find and match up correct Speculum Holder or replace with new Speculum Holder and Adaptor assembly.

Section 2

Problem Solving

Disassembly

1. Remove the speculum holder by un-threading counter clockwise.

2. Remove the adapter by unscrewing the set screw, turning the adaptor 90° either clockwise or counter clockwise, and removing. Be sure to torque and loctite (see recoommended inventory) the set screw per drawing during reassembly.

   Note that the Speculum and Adaptor are a matched set and must be replaced as such together.

   Reassemble in reverse order.